UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS,

PETITIONER,

V.

GENERAL ACCESS SOLUTIONS, LTD.,

PATENT OWNER.

Case No. IPR2023-01147
U.S. Patent No. 9,426,794

EXHIBIT 2007

DECLARATION OF DOUGLAS A. CHRISSAN, Ph.D.

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1. [1.a] a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol; and. 36

2. [1.preamble] and [1.b] a wireless communication device, comprising: . . . a second wireless transceiver coupled the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol; and. 38

3. [1.c] wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile station and provides the first downlink signal to the second wireless transceiver and wherein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol, and.....41

4. [1.d] wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively. 42

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1. [1.preamble] and [1.a] A wireless communication device, comprising: a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol; and. 58

2. [1.b] a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol 61

3. [1.c] wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile station and provides the first downlink signal to the second wireless transceiver and **w**herein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol, and.....62

4. [1.d] wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively. 63

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I, Douglas A. Chrissan, declare as follows:

I. INTRODUCTION

1. I have been retained as a technical expert on behalf of Patent Owner General Access Solutions, Ltd. ("General Access") for the above-captioned inter-partes review ("IPR"). I have been asked to provide my opinions on the technology disclosed in U.S. Patent No. 9,426,794 ("the '794 Patent") (Ex. 1001) and on the unpatentability arguments presented in Verizon's ("Petitioner") Petition ("Pet.") alleging that claims 1–6 of the '794 Patent (the "Challenged Claims") are invalid under 35 U.S.C. § 103.

2. I make this declaration based on my personal knowledge, consideration of the materials I discuss herein, and my expert opinion.

3. I am being paid for my work on this matter on an hourly basis at $300/hour. My compensation is not contingent on reaching any particular findings or conclusions, or on any particular outcome in this matter. I have no financial interest in the outcome of this matter.

4. In preparing this Declaration, I have reviewed the '794 Patent, its prosecution history, and considered each of the documents cited herein. I have also read and considered the IPR Petition concerning the '794 Patent and the exhibits and evidence cited therein as grounds for invalidity, including but not limited to Exhibits 1001–15, the Patent Owner's Preliminary Response, Exhibits 2001–06 and 2009–

14, and the Board's Decision Granting Institution of this IPR. Additional documents reviewed are discussed in Section III below.

5. In formulating my opinions, I have also relied upon my experience, education, knowledge and expertise in the area of wireless and mobile communications systems. In reviewing the material relevant to these proceedings, I have considered the viewpoint of a person of ordinary skill in the art in the January–September 2001 timeframe.

II. BACKGROUND AND QUALIFICATIONS

6. The following sections recite the most relevant aspects of my educational, professional, and technical background. A copy of my curriculum vitae, which describes my qualifications in more detail, is attached to this report as Exhibit 2008.

7. I am presently a technical consultant in the areas of communications systems, multimedia systems, computer systems, and digital signal processing. I have spent well over 1000 hours performing source code review of cellular base stations, from several manufacturers, related to a variety of technical topics including physical layer signal processing, remote radio heads and distributed antennas.

8. I earned a B.S. and M.S. in Electrical Engineering from the University of Southern California in 1988 and 1990, respectively, and a Ph.D. in Electrical

Engineering from Stanford University in 1998.

9. From 1993 to 1997, I was a full-time doctoral student at Stanford University. My Ph.D. dissertation and related publications were in the fields of statistical signal processing and communication systems, and more specifically in the area of impulsive noise modeling for low-frequency communication systems. In 1995, I was the instructor for the graduate Statistical Signal Processing class (EE278) in the Electrical Engineering department at Stanford University. Prior to teaching this class, I was a teaching assistant for ten different classes in signal processing and radio frequency electronics at Stanford.

10. I was a Masters Fellow and Member of the Technical Staff at Hughes Aircraft Company in El Segundo, California, from 1988–1993. While at Hughes Aircraft, I designed and developed wireless communication systems for commercial and military spacecraft, including for the MILSTAR satellite program.

11. Between 1992 and 1993, while at Hughes Aircraft Company, I designed and built a state-of-the-art, 800 megabit-per-second (Mbps) telecommunications modem for the NASA Lewis Research Center.

12. From 1997–2003, I worked at 8x8, Inc., starting as a DSP software engineer in 1997, becoming a manager in 1998, a director in 1999, and Vice President of Engineering in 2000 (managing a team of approx. 60 engineers in the company's microelectronics group). I played a key role in developing several

semiconductor products used worldwide in multimedia and communications devices, mainly for video conferencing systems and Internet Protocol ("IP") telephones. Some of these semiconductor products were in production more than ten years.

13. From 2003–2007, I was a Systems Architect and Engineering Program Manager at Texas Instruments in the Digital Subscriber Line ("DSL") product business unit. At Texas Instruments, I was directly involved in the architecture, design, development and production of multicarrier DSL modem products. My work specifically included architecting a multicarrier DSL semiconductor and software product and managing all aspects of its development from inception to production. I also gained further experience with IEEE 802.11 (WLAN/WiFi) and WiMAX systems.

14. I have developed, and managed the development of, several successful semiconductor, software and systems products in the communications and multimedia fields. These products are listed in the attached curriculum vitae.

III. BASES OF OPINIONS

15. In the course of performing my analysis and forming my opinions, I have reviewed the Petition for this IPR2023-01147 and its Exhibits 1001–15, Patent Owner's Preliminary Response ("POPR"), Exhibits 2001–06 and 2009–14, and Decision Granting Institution.

16. Exhibits 1001–15, 2001–06 and 2009–14 include:

- U.S. Patent No. 9,426,794 ("the '794 Patent") (Ex. 1001) and its file history (Ex. 1008)
- Declaration of Dr. Kevin Almeroth in IPR2023-01147 (Ex. 1002)
- U.S. Patent No. 6,556,553 ("Palmer") (Ex. 1004)
- U.S. Patent No. 6,816,706 ("Hohnstein") (Ex. 1005)
- U.S. Patent No. 5,790,536 ("Mahany") (Ex. 1006)
- U.S. Patent No. 5,722,051 ("Agrawal") (Ex. 1007)
- U.S. Patent No. 9,255,555 ("the '555 Patent") (Ex. 1009)
- IPR2017-01178 (Patent 9,225,555), Paper 21, Final Written Decision (Ex. 1010)
- Claim Construction Order issued in the co-pending Civil Action No. 2:22-CV-00394-JRG involving the '794 Patent (Ex. 2006).

IV. APPLICABLE LEGAL STANDARDS

A. Ordinary Skill in the Art

17. My opinions in this declaration are based on the understandings of a person of ordinary skill in the art—sometimes referred to as an "ordinary artisan" or by the acronyms "POSA" or "POSITA"—as of the time of the invention, which I understand to be the January 19, 2001 filing date of the earliest provisional applications leading to the '794 Patent. I understand that the person of ordinary skill

in the art is a hypothetical person who is presumed to have known the art relevant to the Challenged Claims of the '794 Patent at the time of the invention.

18. I understand that, in assessing the level of skill of a person of ordinary skill in the art, one should consider the type of problems encountered in the art, the prior solutions to those problems found in the prior art references, the rapidity with which innovations are made, the sophistication of the technology, the level of education of active workers in the field, and one's own experience working with those of skill in the art at the time of the invention.

19. Petitioner submits that a POSITA at the time of the '794 Patent would have a bachelor's degree in computer science, electrical or computer engineering, or a related field, and at least 2 years of work or research experience in digital communications systems, such as wireless communications systems and networks, or equivalent, or a Master's degree in electrical engineering, computer engineering, computer science or similar field. Patent Owner has not offered a different understanding of a POSITA, and the PTAB accepted Petitioner's submission. I accept and use Petitioner's and the PTAB's definition of a POSITA.

20. I was at the time of invention, and am, one of more than ordinary skill in the art through my education, research experience and work experience. As of the date of the invention, I was familiar with the types of problems encountered in mobile communications systems and the rapidity at which innovations were made. I

was and am familiar with people having this level of skill in the area of mobile communication systems.

B. Claim Construction

21. I understand that the Challenged Claims of the ’794 Patent in this IPR are generally interpreted according to their ordinary and customary meaning taking into consideration the so-called “intrinsic evidence” of the patent consisting of (1) the claim language; (2) the specification; and (3) the prosecution history.

22. I understand that claim terms may be explicitly defined in the patent specification or they may be implicitly defined through consistent usage in the specification. I also understand that the scope of claim terms may be limited by statements in the specification or prosecution history where the applicant clearly disavows or disclaims subject matter.

23. I understand that claim construction is a matter of law. To the extent the Board has already provided claim construction guidance for claim terms in the ’794 Patent, including in earlier IPRs such as IPR 2017-01889 involving this same ’794 Patent, I follow that guidance. Furthermore, in a co-pending district court case involving this same ’794 Patent, the Court issued a claim construction order on January 12, 2024. Ex. 2006 (2:22-cv-00394-JRG, Doc. 86). I use the claim constructions provided by the Court. I discuss the Court’s constructions of specific terms in the Challenged Claims in section VI below.

C. Obviousness

24. Counsel has informed me, and I understand, that an issued patent claim is invalid as obvious if it can be shown that the differences between the patented subject matter and the prior art are such that the subject matter as a whole would have been obvious, at the time the invention was made, to a person having ordinary skill in the art. Relevant considerations include the level of ordinary skill in the art; the scope and content of the prior art; differences between the prior art and the claims at issue; and the objective indicia, or secondary considerations, of nonobviousness.

25. In this regard, I am informed and I understand that the secondary considerations of nonobviousness could include factors such as commercial success, long felt but unresolved needs, the failure of others, skepticism by experts, praise by others, award and accolades, and copying.

26. Counsel has informed me, and I understand, that in order to evaluate the obviousness of any claim of the ’794 Patent over a given prior art combination, I should analyze whether the prior art references, included collectively in the combination, disclose each and every element of the allegedly invalid claim as those references are read by the person of ordinary skill in the art at the time of the invention.

27. Counsel has informed me, and I understand, that even where all of the claim limitations are expressly disclosed in the prior art references, there must be

some showing that a person of ordinary skill in the art would have been motivated to combine such prior art references, and explanation of how the combination would be achieved, and that there would have been a reasonable expectation of successfully achieving the claimed invention from such combination.

28. Counsel has informed me, and I understand, that absent some additional reasoning, mere routine optimization for a person of ordinary skill in the art to arrive at the claimed invention through combination of prior art references is insufficient to support a conclusion of obviousness.

29. Counsel has informed me, and I understand, that to rely on a reference it must be analogous prior art. Counsel has informed me and I understand that a reference is considered analogous prior art: (1) if the reference is from the same field of endeavor as the claimed subject matter, or (2) if the reference "is reasonably pertinent to the particular problem with which the inventor is involved," even though the reference is not within the field of the inventor's endeavor.

30. Counsel has informed me, and I understand, in considering the obviousness of a claimed invention, one should not view the invention and the prior art with the benefit of hindsight. In an obviousness analysis, one must be aware of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning. Counsel has instructed me and I understand that when considering obviousness, I should not consider what is known today or what was

learned from the asserted patents. Instead, obviousness is assessed by the person of ordinary skill in the art at the time the invention was made.

31. In this regard, I am informed and I understand that the ’794 Patent may not be used as a guide to select and understand the prior art, because such an approach, at a minimum, discounts the value of combining various existing features or principles in a new way so as to achieve a new result.

32. Counsel has informed me, and I understand, that obviousness cannot be predicated on what was unknown at the time of the invention, even if the inherency of a certain feature is later established. Counsel has also informed me, and I understand, that unknown properties of the prior art may not be relied upon to provide the rationale for modifying or combining the prior art to reach the claimed subject matter.

33. Counsel has informed me, and I understand, that a reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant of the ’794 Patent.

V. OVERVIEW OF THE ’794 PATENT

34. I generally agree with Section II (“Background”) from the POPR, including Sections II.A (“WANs, LANs, and Base Stations”), II.B (“The ’794 Patent”) and II.C (“The ’555 IPR”). Therefore, some of this technical overview

section is reproduced from Section II of the POPR, with further edits.

A. WANs, LANs, and Cellular Base Stations

35. Computers, mobile phones, televisions, and other technology often work as part of a network. The specific network is a matter of design. Wide Area Networks (WANs) connect such things as mobile phones, fixed wireless devices and hotspot access points (e.g., MiFi devices) in large geographical areas such as a campus or city. Local Area Networks (LANs) connect computers, tablets, televisions, appliances, thermostats, alarm systems, and other devices in smaller areas, such as a single building or single portion of a building.

36. Different types of wired and wireless networks qualify as a WAN. Examples of wireless WANs ("WWANs") at the time of the patent include RAM Mobile Data (using a Mobitex network), CDPD (Cellular Digital Packet Data), ARDIS (Advanced Radio Data Information Services) and satellite communication. Ex. 1006 at 45:44–45. At the time of the '794 Patent, WANs typically "only provide point-to-point communications, use a narrow bandwidth, and often exhibit heavy communication traffic. Moreover. WANs require relatively higher transmission power-a negative factor in the ever increasing need for power savings associated with portable transceiving devices. As a result, WANs are generally slow and expensive. and simply do not provide an effective overall solution." *Id*. at 3:12–20. It was against this existing WAN backdrop that cellular wireless networks—

typically designed for voice calls—were evolving to provide more cost-effective, wide-area data services.

37. Different types of wired and wireless networks qualify as a LAN. Examples of wired LANs at the time of the '794 Patent include IEEE 802.3 Ethernet and IEEE 802.5 Token Ring. Ex. 1006 at 25:64–65. Examples of wireless LANs at the time of the '794 Patent include European Telecommunications Standards Institute (ETSI) HiperLAN/1 and HiperLAN/2, and Institute of Electrical and Electronics Engineers (IEEE) 802.11 (WiFi).

38. In cellular wireless networks, base stations or "cell towers" serve as the main communication hub for mobile wireless devices on the network. Base stations generally have a number of antennas with transceivers capable of sending and receiving radio frequency ("RF") signals to and from wireless devices. Cellular base stations connect with mobile devices in a "hub and spoke" architecture.

39. Communications between wireless devices such as cellphones, even if they are in proximity to one another, are typically routed through the base station serving those devices to a core network that makes the voice or data connection between those devices. LAN communications between two devices on the same LAN, however, typically remain within the LAN, with the LAN access point making the connection between those devices.

40. Cellular wireless networks that offer broadband data communication,

such as 4G or 5G cellular networks, are ubiquitous today. But, at the time of the '794 Patent, this technology was in its infancy, and wireless cellular networks were generally limited to voice communications, rudimentary text messaging, and limited data transmissions. *See* Ex. 2012 (*What is 5G? Everything You Need to Know About 5G*, QUALCOMM.COM, https://www.qualcomm.com/5g/what-is-5g (last visited May 1, 2024)). The '794 Patent introduced a novel way to leverage the nascent cellular broadband technology with LAN technology to provide "hotspot" functionality to multiple mobile devices.

B. The '794 Patent

41. The '794 Patent, to Paul F. Struhsaker, is entitled "Wireless Communication System and Device for Coupling a Base Station and Mobile Stations." It is directed to a wireless device equipped with both WAN and LAN transceivers that route communications from a cellular base station to wireless LAN transceivers that provide "hotspotting" functionality for other mobile devices in the LAN. *See* Ex. 1001 at 4:33–36 ("A wireless broadband communication system has been proposed, for instance, by which to permit the effectuation of any of various communication services by way of radio links …"). Wireless local area networks ("WLANs"), known at the time of the '794 Patent, differ from WANs in that "[g]enerally, the communication ranges of the mobile stations operable in such systems [wa]s relatively small." *Id*. at 4:64–65.

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42. The wireless system and device of the ’794 Patent contains two different transceivers. The first transceiver receives communications using WAN communication protocols from a base station (*e.g.*, a 4G or 5G base station) and sends that information to a second transceiver within the device. The second transceiver then routes the information to other mobile stations using a LAN communication protocol (*e.g.*, Wi-Fi protocols). Both transceivers operate wirelessly. Thus, unlike Wi-Fi devices operating in conventional wired networks, the first transceiver receives transmissions from a ***wireless*** cellular base station, and the second transceiver transmits ***wirelessly*** to mobile devices in the LAN. In doing so, the second transceiver also monitors signal characteristics and routes information to different mobile devices that take advantage of the “hotspot.”

43. The ’794 Patent discussed how this device could enable the creation of a novel broadband cellular system. “When WLAN service is provided to a plurality of fixed-site subscriber stations, cellular coverage areas are formed.” *Id*. at 3:49–51. Setting up numerous LAN access points, each of which is able to communicate with broadband cellular base stations, “provides a radio infrastructure throughout a geographical area throughout which wireless broadband communication services are effectuable.” *Id*. at 5:14–16. At a time when cellular broadband was still in early development and lacked the ability to provide broadband service to mobile subscribers, the ’794 Patent created a novel system for providing this service

utilizing a network of LAN transceivers connected to cellular WAN base stations.

44. Claim 1 recites the following wireless communication device:

> A wireless communication device comprising:
>
> a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol, and
>
> a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol,
>
> wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile station and provides the first downlink signal to the second wireless transceiver and wherein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol, and
>
> wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first

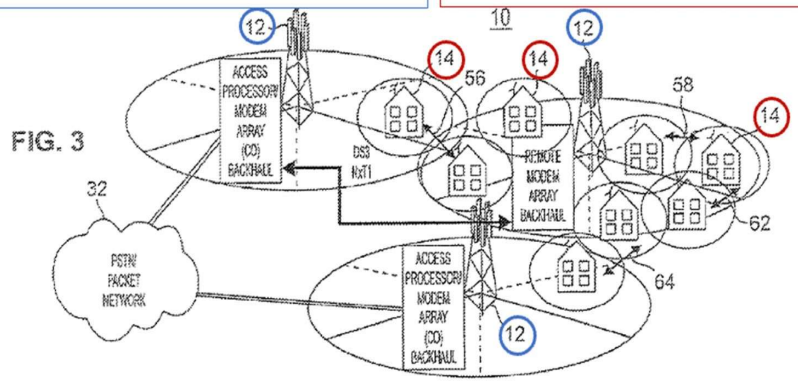
> mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively.

45. The ’794 Patent thus claims a “two-layered” wireless communications system, in which the first layer consists of the wide area network established between the base station and the first transceiver and a plurality of wireless communication devices, and the second layer consists of the local area network established between the second transceiver and each of the same plurality of wireless communication devices and a plurality of mobile stations. Different protocols govern the communications in each layer of the combined network. A “protocol” is a term of art in the network architecture domain, generally meaning an established set of rules for transmissions to and from devices.

46. Figure 3 of the ’794 Patent illustrates the then-novel network infrastructure.

Fig. 3 "illustrates the communication system **10**, here showing a plurality of **base stations 12**..." Ex. 1001 at 9:20-21.

Fig. 3 "illustrates . . . **subscriber stations 14** associated with various ones of the base stations." Ex. 1001 at 9:20-22.



Id., Fig. 3 (annotated). A "plurality of base stations **12**" (circled in blue) provide "broadband communication services" to subscriber stations 14 (circled in red). *Id*., 7:31–35, 9:20–22. "Each of the subscriber stations includes a WLAN transceiver." *Id*., 9:23. "The WLAN transceiver defines a coverage area **42** defining a cell," and provides communications to mobile stations in that cell. *Id*., 8:2–5. As explained in the Abstract, the base station communicates "according to a wide area wireless communication protocol," while the WLAN communicates "according to the local area wireless communication protocol." *Id*. at Abstract.

47. Thus, the '794 Patent defines a specific architecture that includes a WAN and LAN and the accompanying protocols that govern those networks, and it also includes specific functions that the transceivers do in relaying downlink signals to the mobile stations, and then monitoring signal characteristics to route information.

48. Another important aspect of the '794 Patent is that the second

transceiver in the wireless device monitors pertinent "signal characteristics" and based on those signal characteristics routes information to the LAN devices. A specific limitation of claim 1 makes this clear:

> wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively.

Id. at 10:38–44. Thus, the transceivers of the '794 Patent thus do not merely transmit and receive signals but also perform monitoring and routing functions.

49. This Wireless Local Area Network transceiver—referred to as the "second transceiver" in the claims—can also orchestrate the distribution of information among mobile stations within the local area network. The fact that LANs enable communications between devices in the same local area is common today, as we all see and know with such things as modern-day SONOS systems or wireless televisions that use YouTube TV. These devices can and do directly communicate with other LAN-enabled devices, such as iPads or computers, within the LAN in your home. Many such devices lack the capability of communicating directly with a WAN (*e.g.*, an iPad that only has Wi-Fi capability and no cellular capability).

50. Information can be routed to these devices from a WAN only via the LAN transceiver. In an industrial setting, these capabilities might be even more important because they enable secure, local communications that a company may not want shared with the cloud, and minimize use of the WAN. Because the wireless devices of the '794 Patent enable two different types of communications, they need to have routing and scheduling capabilities.

51. Finally, the '794 Patent describes that the "base station" has a transceiver within a cellular network that communicates with an external network, transmits forward channel broadband signals from the external network to a plurality of wireless devices and receives reverse channel broadband signals from the plurality of wireless devices to transmit back to the external network. The patent describes transceiver base station **12** being set up and coupled to "a communication network **32** such as a public-switched telephonic network" or the Internet. *Id*., 7:50–56. The base station includes a radio link "upon which forward link channels **18** and reverse link channels **22**" permit broadband communications. *Id*., 7:31–34. Further, Claim 1 of the '794 Patent expressly claims that the base station "communicates with the first wireless transceiver and a plurality of other wireless communication devices." *Id*., 10:19–22. In other words, the claimed base station does not comprise multiple individual transceivers, each communicating point-to-point with a single one of the plurality of wireless communication devices (including the one with the first wireless

transceiver). Instead, the base station claimed in the '794 Patent, which includes at least one remote modem (*see* Ex. 1001 at 7:44–49, *passim*), uses a transceiver to communicate with more than one of the communication devices. A person of ordinary skill in the art would understand this based on the '794 Patent and specifically Figure 2 (depicting "RF modem sectors") and Figure 3 (depicting three ordinary cellular towers 12). *Id*. at 4:33–54, 7:44–49, 9:20–41.

C. Challenged claims 1–6

52. Challenged claims 1–6 recite as follows:

> 1. A wireless communication device comprising:
>
> a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol, and
>
> a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol,
>
> wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile

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station and provides the first downlink signal to the second wireless transceiver and wherein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol, and

wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively.

2. The wireless communication device of claim 1, wherein the second wireless transceiver is coupled to the first wireless transceiver by a wireline connection.

3. The wireless communication device of claim 2, wherein the second wireless transceiver is removably coupled to the first wireless transceiver.

4. The wireless communication device of claim 1, wherein the first wireless transceiver and second wireless transceiver are disposed in a fixed site subscriber station.

5. The wireless communication device of claim 1, wherein the first wireless transceiver and the second wireless transceiver are part of an integrated device.

6. A method for communicating with a wireless communication device, comprising:

a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol; and

a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol, the method comprising:

receiving, using the first wireless transceiver from the base station, a first downlink signal intended for the first mobile station;

providing, using the first wireless transceiver, the first downlink signal to the second wireless transceiver;

receiving, using the second wireless transceiver, the first downlink signal and re-transmitting the first downlink

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signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol;

monitoring, using the second transceiver, first signal characteristics of the second downlink signal of the first mobile station;

monitoring, using the second transceiver, second signal characteristics of the second mobile station; and

based on the first signal characteristics and the second characteristics, routing, using the second transceiver, information to the first mobile station and the second mobile station, respectively.

D. Comparison of US Patent 9,225,555 to the '794 Patent

53. Petitioner attempts to compare the '794 Patent to US Patent 9,225,555, which was found invalid in a preceding IPR2017-01178 (with one judge dissenting). Ex. 1010. However, there are substantial differences between these two patents.

54. Claim 1 of the '555 Patent and Claim 1 of the '794 Patent are presented side-by-side below:

US 9,225,555 B2	US 9,426,794 B2
1. A wireless communication device, comprising: a first transceiver in direct wireless communication with a terrestrial base station, wherein the terrestrial base station is in direct wireless communication with a plurality of wireless communication devices; and a second wireless local area network transceiver in direct wireless broadband communication with a plurality of computing devices located within a coverage area of the second transceiver, the second transceiver being coupled to the first transceiver wherein; the first transceiver receives a first signal from the base station, the first signal intended for a first computing device of the plurality of computing devices, the second wireless local area network transceiver determines signal characteristics of the first computing device, and the second transceiver transmit the first signal to the first computing device based on the determined signal characteristics of the first computing device; and the second transceiver receives a second signal from the first computing device, the second signal intended for the base station, and the first transceiver transmits the second signal to the base station.	1. A wireless communication device, comprising: a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol; and a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol, wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile station and provides the first downlink signal to the second wireless transceiver and wherein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol, and wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the

	second characteristics, routes information to the first mobile station and the second mobile station, respectively.

Ex. 1001, 10:17–44, Ex. 1009, 12:52–13:7 (with notable differences in the '794 Patent annotated in green highlight).

55. The first notable difference between the '794 Patent and the '555 Patent is the addition of "according to a wide area wireless communication protocol." The addition of this clause limits the base station's communications with the first wireless transceiver and the plurality of other wireless communication devices to be a single WWAN protocol, rather than a plurality of WWAN protocols. As such, systems where the first wireless transceiver and the plurality of other wireless communication devices communicate with the base station using different links are outside the scope of the claim, as each link may use its own WWAN protocol. (See Section V.A for examples of WWAN protocols). By adding the limitation "according to a wide area wireless communication protocol," claim 1 of the '794 patent is limited the preferred embodiments of Figs. 2 and 3 of the '794 patent,

reproduced below, wherein each base station 12 communicates in a point-to-multipoint cellular network with a plurality of subscriber stations 14 that are within that base station's coverage area.

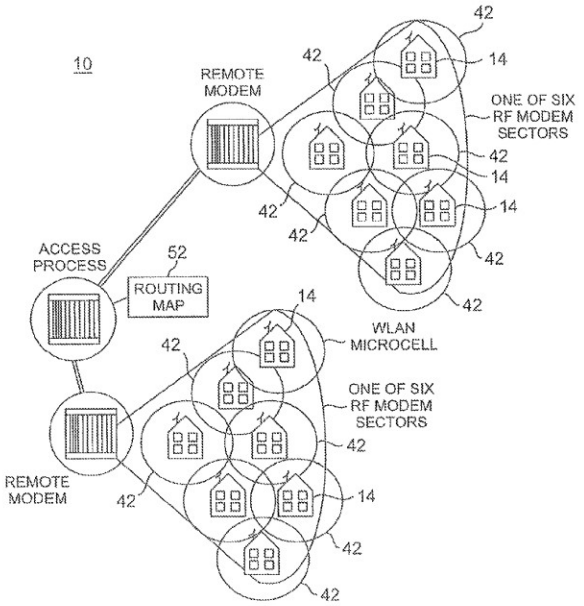


FIG. 2

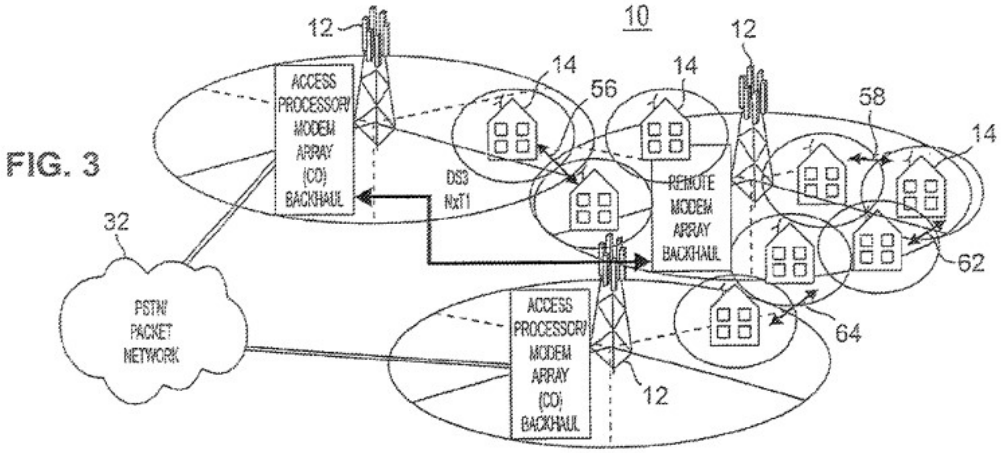


FIG. 3

Ex. 1001, Figs. 2 and 3.

56. The second notable difference between the '794 Patent and the '555

Patent is the addition of "wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol." Similar to the WWAN discussion above, this element restricts the communication between the second wireless transceiver and its connected mobile stations to use only one WLAN protocol.

57. The third notable difference between the '794 Patent and the '555 Patent is the addition of "and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively." Therefore, within the scope of the '794 Patent's claims, the second transceiver must monitor second signal characteristics of the second mobile station. More importantly, it must, "based on the first signal characteristics and the second characteristics, route[] information to the first mobile station and the second mobile station, respectively."

58. In my opinion, the three additional claim terms pointed out above, especially taken together, render the analysis of the '555 Patent and the asserted prior art in IPR2017-01178 distinct from—and therefore inapplicable to—this IPR. I provide further details and analysis in this regard where appropriate hereafter.

VI. CLAIM CONSTRUCTION OF '794 PATENT CLAIM TERMS

59. The United States District Court for the Eastern District of Texas

Marshall Division has construed the following terms of the '794 Patent:

Term	Court's Construction
"wireless communication device[s]" ('794 Patent, Claims 1–6)	Plain and ordinary meaning. Specifically, there is no requirement that the wireless communication device be fixed.
"first wireless transceiver operable to communicate with a base station" ('794 Patent, Claims 1, 6)	Plain and ordinary meaning. Specifically, there is no requirement that the first wireless transceiver be fixed.
"[routes/routing] information to the first mobile station and the second mobile station, respectively" ('794 Patent, Claims 1, 6)	"[directs/directing] information through a specified path to the first mobile station and the second mobile station, respectively"

Ex. 2006 (2:22-cv-00394-JRG, Doc. 86). I use these constructions in my analysis.

60. In the district court's construction of "[routes/routing] information to the first mobile station and the second mobile station, respectively" as "[directs/directing] information through a specified path to the first mobile station and the second mobile station, respectively," the district court noted "that simply 'forwarding information,' without more, is not 'routing' because the intrinsic evidence (citing Ex. 1001, 8:61–9:3, 9:6–19) and "cited definitions show the ordinary meaning of 'routing' requires a specific path." Ex. 2006, 22–23.

61. The PTAB did not construe any terms in the Decision Granting Institution. Paper 14, p. 12–13. However, the PTAB did provide guidance that "[o]n

the current record, we decline to read into the claims any further requirements concerning the base station beyond those expressly recited in the claims." *Id*., p. 15. Therefore, my analysis relies on no further requirements—with respect to the plain and ordinary meaning of "base station"—beyond those expressly recited in the claims.

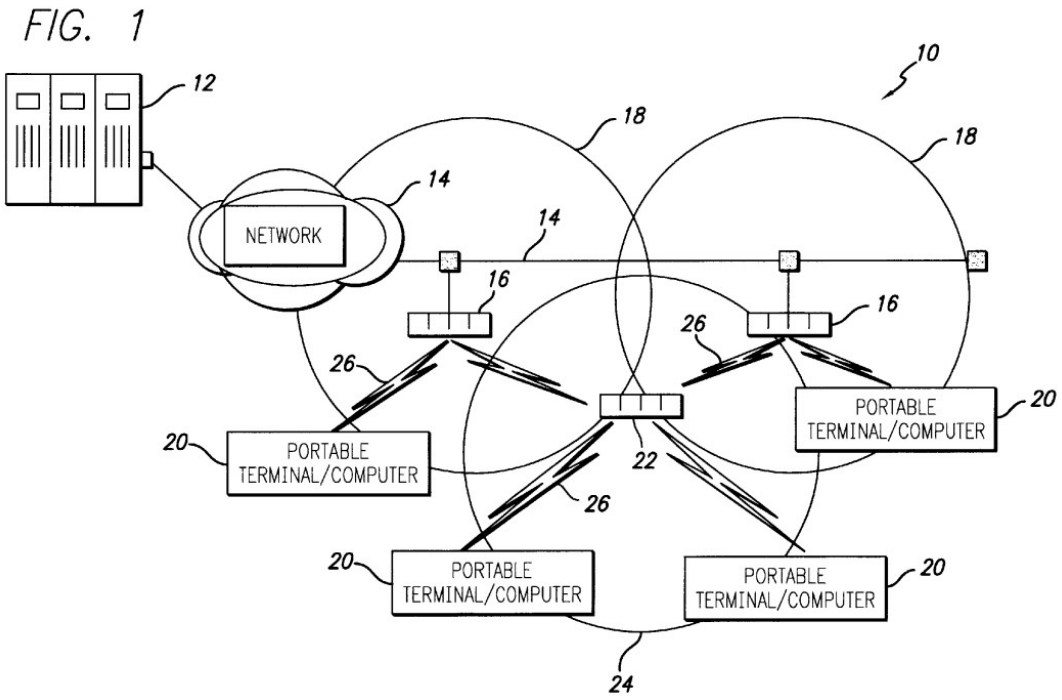
VII. THE ASSERTED PRIOR ART

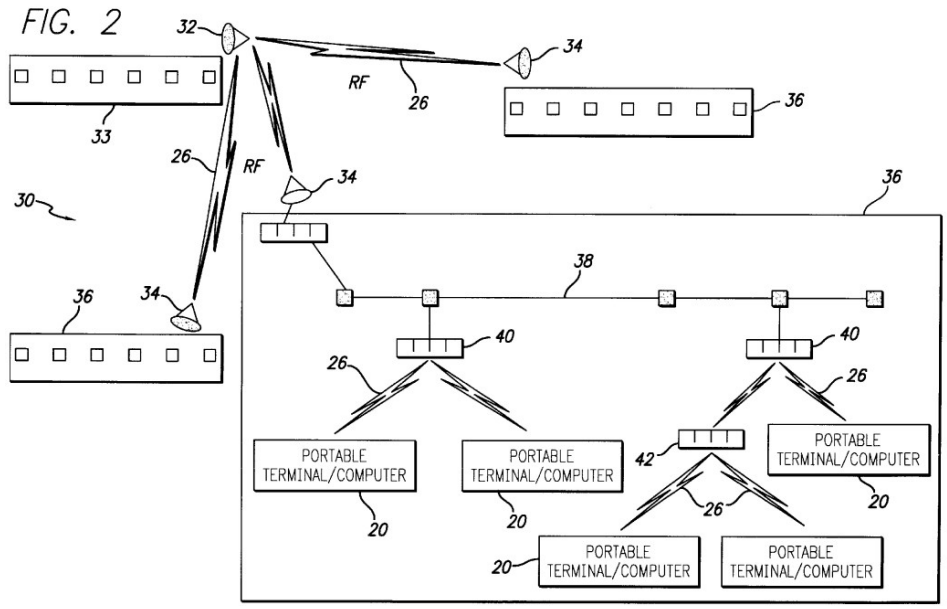
A. Palmer (Ex. 1004)

62. U.S. Patent No. 6,556,553 to Palmer et al. is entitled "Method for Determining When A Communication Device Should Rate Shift or Roam in a Wireless Environment." Ex. 1004.[1] As its title suggests, Palmer focuses on methods related to determining if and when a "portable terminal/computer" (indexed as "20" in Figs. 1 and 2, reproduced below, and hereafter referred to as a "terminal") should rate shift, or roam, or do neither.

[1] I generally agree with Section II.D.1 ("Palmer") from the POPR. Therefore, some of this overview section is reproduced from that section of the POPR, with further edits.

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Ex. 1004, Figs. 1 & 2. Palmer explains "rate shift" and "roam" in the following sentence: "[i]f the RF connection begins to degrade, a determination should be made as to whether communication performance would improve by transmitting at a lower information rate or roaming to another cell offering a higher quality RF

connection." *Id*., 5:26–30. Therefore, "rate shift" refers to a terminal's staying with the same access point 16 (in Fig. 1) or 40 (in Fig. 2), but lowering its information rate to get a more reliable connection (e.g., with lower bit error rate). *Id*. at Figs. 1 & 2, 5:26–30. Alternatively, "roam" means to move completely to another cell and its access point, presumably one offering a higher quality RF connection. *Id*.

63. Palmer explains that rate shifting and roaming are necessary, "[f]or example, in a WLAN," when a "mobile worker . . . travels within a cell or from one cell to another." *Id.* at 1:53–65. Palmer explains that then-existing protocols for rate shifting and roaming in a LAN were "relatively inflexible," and "may result in the loss of a network connection." *Id.* at 2:7–30. To address these issues, Palmer proposed a method that "improves communication by dynamically and flexibly anticipating when a rate shift or roam should occur." *Id.* at 2:60–65.

64. Palmer focuses on a network of LANs connected to a wired network, and does not teach or disclose a wireless wide area network. With respect to its Fig. 1 embodiment (see Fig. 1 above), Palmer explains that its "communication system **10** includes a central host processor **12** connected to a **wired network 14**." *Id.* at 4:27–28 (emphasis added). "The **wired network 14** has a plurality of access points **16** that are coupled to the **wired network**." *Id.* at 4:34–36 (emphasis added). Palmer's WLAN "access point **16** acts as a bridge from the wireless communication

[area] defined by its cell **18** to the wired network." *Id.* at 4:42–44; *see also id.* at 4:64–5:9 (explaining how the system shown in Figure 2 connects mobile devices to a wired network).

65. In Palmer's Fig. 2 embodiment, as compared to Fig. 1, the link from the central host processor 12 (or "administration building 33" in Fig. 2, also described at col. 4, ll. 60–62) to the in-building wired network 14 (or wired network 38 in building 36 in Fig. 2, also described at col. 4, ll. 64–65) has been changed from wired to wireless. The wireless links labeled "26" connect administration building 33's central antenna 32 with three antennas 34 at three building sites 36 respectively.

66. Palmer does not describe that its wireless system comprising antennas 32 and 34 is a wide area network, or a WAN, or a wireless wide area network, or a WWAN. *See* Ex. 1004, *generally*. However, Palmer is not completely silent on the disclosure of a WAN either. *Id*., 5:17–19. In the *one* instance that Palmer mentions a WAN *at all*, it does so in the context that a terminal 20 might have some additional WAN radio, not otherwise discussed by Palmer, so that "the wireless communication device 20 may also transition between buildings *or comprise part of a wireless wide area network*." *Id* (emphasis added). This statement is telling, because it makes it clear that 1) it is possible for a terminal 20 to transition between buildings by roaming from one coverage area 18 to another (presuming coverage overlap between them), 2) Palmer knows what a WWAN is, and 2) Palmer considers a WWAN to be

something external to his device.

67. Palmer recognizes that if a terminal 20 moves from one building 36 to another building 36, it may lose coverage within Palmer's system. Therefore, to stay connected to the administration building 33 in such cases, Palmer teaches that terminal 20 may also "comprise part of a [WWAN]", which means it incorporates an added WWAN transceiver so that it can connect to some otherwise undescribed WWAN network.[2] *Id.* A POSITA would recognize that if Palmer considered its antennas 32 and 34 to be part of a WWAN, Palmer would have described terminal 20 as having an additional WWAN transceiver to connect to antenna 32, rather than describing that terminal 20 could attach to some other, unexplained WWAN.

68. For the reasons described above, Palmer does not teach or disclose a WWAN in its invention, and in fact teaches that its invention does not utilize a WAN.

69. Palmer also does not teach that its access point monitors signal characteristics.

70. Palmer teaches that the determination to rate shift or roam "could be

[2] This concept of having an additional WWAN transceiver for use on some other network when traveling too far from a WLAN is also discussed in Section VII.E below, for asserted prior art Mahany.

made by the wireless communication device 20 having a processor and a memory, with the processor executing a stored program for carrying out the method steps discussed below. Alternatively, the method steps may be performed centrally, for example, by the network or a central host processor." *Id*. at 5:30–36. Therefore, the determination is made either in a terminal 20, or in one of the centrally located devices such as network 14 or central host processor 12 (in Fig. 1), or a device in administration building 33 (in Fig. 2). *Id*., Figs. 1 & 2.

71. Petitioner and Petitioner's expert argue that Palmer's access point could also make a decision to rate shift or roam, stating "Palmer's access point 40 performs such monitoring, as Palmer describes monitoring 'may be performed centrally, for example, by the network' (id., 5:34–36)." and "Palmer's access point 40 performs such monitoring, as Palmer describes the monitoring being performed "by the network," and the access point 40 is part of the network and the specific component directly interacting wirelessly with the portable terminals 20 and therefore collecting such measurements." Pet. at 25; Ex. 1002, ¶ 95. However, a POSITA recognizes that an access point does not qualify as "centrally, for example, by the network or a central host processor." Instead, this phrase refers to one of the centrally located devices such as network 14 or central host processor 12 (in Fig. 1), or a device in administration building 33 (in Fig. 2). *Id*., Figs. 1 & 2.

72. Further, Petitioner's citations do not support its allegations that Palmer

supposedly discloses that access point 40 monitors signal characteristics of the mobile devices and routes information based on monitoring those signal characteristics. For instance, the Petition cites to a description of a "predictive method" as shown in Palmer's Figure 3 in support of this proposition, but Palmer's Figure 3 says absolutely nothing about access point 40 monitoring signal characteristics, nor does it even include a general disclosure that addresses this claim element. *See* Pet., pp. 24–25; *see also* Ex. 1004, 5:19–47. To the contrary, the passage that immediately precedes that relied upon by Petitioner explains that other parts of Palmer's system—not access point 40—perform the functions that the Petitioner alleges meet the monitoring signal characteristics limitations. Specifically, Palmer refers to examining the RF connection to the mobile devices, particularly when that signal starts to degrade, and details: **"[t]his determination could be made by the wireless communication device 20** having a processor and a memory, with the processor executing a stored program for carrying out the method steps discussed below. **Alternatively, the method steps may be performed centrally, for example, by the network** or a central host processor." Ex. 1004, 5:19–36 (emphases added). Thus, as discussed above, Palmer discloses that the "predictive method" that the Petitioner claims is "monitoring signal characteristics" is done either by the mobile station 20 in Palmer, or by the central network. Palmer makes no reference to what the Petitioner identifies as its second transceiver or the

LAN transceiver—access point 40—in this passage. *See id.*

73. Even if Palmer did disclose that an access point monitors signal characteristics (which it does not), including even signal characteristics of two distinct mobile stations (which it does not), Palmer still does not teach or disclose "based on the first signal characteristics and the second characteristics, direct[ing] information through a specified path to the first mobile station and the second mobile station, respectively." Instead, Palmer only teaches making a decision by one mobile station to rate shift or roam.

B. Palmer (Ground 1) Does Not Teach or Disclose the Challenged Claims

74. In Ground 1, Petitioner asserts that Palmer anticipates and/or renders obvious challenged claims 1–4 and 6. I disagree, for the following reasons.

1. [1.a] a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol; and

75. As described in Paragraphs 64–67 above, Palmer does not teach the claim element "a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol," because Palmer does not teach or disclose that its communication system 30 is a WWAN. In fact, also as described above, Palmer

provides clear guidance that it is not a WAN. Therefore, Palmer also does not teach or disclose a WWAN protocol or a first wireless transceiver operable to communicate with a base station that communicates according to a single WWAN protocol, as encompassed by the challenged claims and envisioned by the ‘’794’s inventors.

76. Palmer describes “[t]he communication system 30 includes a central antenna 32 that communicates through RF links 26 to a plurality of remote antennas 34.” Ex. 1004, 4:57–59. However, Palmer does not describe these links or any protocols associated with them, stating only “[t]he radio frequency (RF) wireless links are represented symbolically by RF links 26.” 4:40–42. Especially by use of the word “symbolically,” Palmer generalizes these links to be any kind or assortment of RF connections.[3] Therefore, even if a POSITA were to oppose Palmer’s own understanding that its communication system 30 is not a WWAN (because, as discussed above, Palmer identifies a WAN as a system external to Palmer’s), that POSITA still would recognize that Palmer does not teach a “base station [that]communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol.”

[3] Note that Hohnstein, described next, generalizes its analogous links in the same way.

2. [1.preamble] and [1.b] a wireless communication device, comprising: . . . a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol

77. The challenged claims recite a wireless communication device that comprises a first wireless transceiver and a second wireless transceiver. Ex. 1001, 10:17–56. Put another way, the first wireless transceiver and second wireless transceiver must be part of the same device. Claims 2, 3, 4 and 5 recite various configurations of the two transceivers, but all of these configurations are still one device, not two devices connected by an additional, distinct network also containing other devices. *Id*. Claim 2 recites that the two transceivers may be connected by a wireline connection (i.e., a cable); claim 3 recites that they may be in separate enclosures that are detachable from each other; claim 4 recites the device may be at a fixed site; claim 5 recites that they may be integrated together in the same enclosure. *Id*. However, there is no embodiment in the '794 patent—in the claims or elsewhere—whereby the first and second wireless transceivers are separated by an *entire additional network*, as the remote antenna 34 and the access points 40 are in

Palmer[4]. Ex. 1001, generally; Ex. 1004 at Fig. 2, 4:64–5:3 ("The building 36 may include a ***wired network 38*** with a plurality of access points 40…. The access point 40 would provide a bridge for the wireless communication devices 20 to the ***wired network 38***"). A POSITA recognizes that different devices connected by a wired network 38, i.e., a wired LAN, are in fact *different devices*, rather than a single device. *See, e.g*. Ex. 2009, p. 3 (Newton's Telecom Dictionary, defining LAN as "[a] short distance data communications network (typically within a building or campus) used to link **computers** and peripheral **devices** (such as printers, CD ROMs, **modems**) under some form of standard control" (emphasis added)).

78. Petitioner's expert recognizes that Palmer's remote antenna 34 (and its associated, unlabeled box in Fig. 2) are separated from access points 40 by an entirely separate, additional wired LAN 38. Ex. 1002, ¶¶ 69–72. I assume he also recognizes, as a POSITA would, that devices on a LAN are in fact each a distinct device. *See, e.g*. Ex. 2009, p. 3 (Newton's Telecom Dictionary, defining LAN). To the extent remote antenna 34 may have an additional transceiver, it would be only

[4] In Figure 2, Palmer's remote antenna 34 is connected to an unlabeled box on wired network 38. A POSITA would understand this box to be a bridge between the wireless connection and the wired network 38, and would thereby include a transceiver for the wireless connection and a transceiver for the wired network 38.

to connect to the entirely separate, additional wired LAN 38. Ex. 1004, Fig. 2. Likewise, to the extent access points 40 may have an additional transceiver, it would be only to connect to the entirely separate, additional wired LAN 38. *Id*.

79. Therefore, Petitioner's expert begins by arguing that, due to claim differentiation, the claimed "wireless communication device" of claim 1 of the '794 Patent is not necessarily an *integrated* device. Ex. 1002, ¶¶ 69–72. As I explain in Paragraph 77 above, while it's true that claims 2–5 recite different possible configurations for the "wireless communication device," including a configuration using two enclosures with a wireline (i.e. cable) connecting them, none of these configurations encompass splitting the one device into two entirely separate devices across a separate, additional local area network.

80. Petitioner's expert then opines, in view of Palmer's remote antenna 34 and its access points 40, that integration of these components within a single device would still have been an obvious variant. *Id*., ¶ 70. I disagree, for at least two important reasons: in Palmer, 1) there are *multiple access points* 40 for each remote antenna 34; and 2) access points 40 are *meant* to be spread around the building and to be geographically away from remote antenna 34, as opposed to being co-located. These two reasons *require* there to be a LAN in Palmer, and for the remote antenna 34 to be a distinct device from each access point 40. Therefore, a POSITA studying or implementing Palmer would have found no motivation or reason at all to combine

these devices into one, or to configure the system to have each remote antenna 34 connected to its own, single, dedicated access point 40.

81. Palmer's architecture and the related discussion above reveal fundamental differences between Palmer and the '794 Patent. The '794 Patent's claimed device and method enable hotspot operation: in a system comprising a one-to-many cellular-style WWAN, the '794 Patent's device is a WWAN transceiver with its own WLAN transceiver, which then provides one-to-many WLAN service. Palmer does not disclose a WWAN, or a one-to-many cellular-style WWAN, or that its transceiver supporting RF link 26 (in Fig. 2) has its own WLAN transceiver. In fact, Palmer teaches the opposite: its transceiver supporting RF link 26 (in Fig. 2) is a separate device from any WLAN transceiver, and the two are connected via an additional LAN network. Therefore, Palmer does not teach or disclose this claim element.

3. [1.c] wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile station and provides the first downlink signal to the second wireless transceiver and wherein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol; and

82. As described in Sections VII.B.1–2 above, Palmer does not teach or disclose a first wireless transceiver and a second wireless transceiver that satisfy the

claim language. The first wireless transceiver and second wireless transceiver in Palmer, in fact, are separated by a local area network with its *own* protocol. Therefore, Palmer does not teach or disclose the '794 Patent's claim element [1.c].

4. [1.d] wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively

83. As described in Paragraph 69–73 above, Palmer does not teach or disclose the claim element "wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively," because Palmer's second transceiver does not perform "monitors…" or "routes…" as recited by the claim language.

84. Petitioner's expert opines that "Palmer describes a wireless communication system that can span multiple buildings or even an entire city. The system incorporates a device that provides connectivity between a WWAN and a WLAN." Ex. 1002, ¶¶ 59, 78. However, as I describe in Paragraphs 64–67 above, Palmer does not disclose a WWAN, and in fact refers to a WWAN as distinct from

its invention. In opining that Palmer discloses a WWAN protocol, Petitioner's expert recites an excerpt from Palmer as follows, "[t]he method would further reduce network connection losses due to the ***use of industry standard network protocols*** by the wireless media" (emphasis reproduced) and then states "A POSA would have therefore understood based on these teachings in Palmer that a wide area wireless communication protocol is used for the wireless transmissions between central antenna 32 and the multiple remote antennas 34" Ex. 1002, ¶ 78–79 (citing Ex. 1004, 2:52–55). However, Palmer only discusses rate shift or roam with respect to its local cells 18, not with respect to the wireless transmissions between central antenna 32 and the multiple remote antennas 34. Ex. 1004, *generally*. Therefore, Palmer's discussion of "***industry standard network protocols***" applies only to the local network. Palmer does not describe wireless transmissions between central antenna 32 and the multiple remote antennas 34 as being standardized, or as being part of a WWAN, or as using a WWAN protocol.

85. Moreover, a POSA would recognize that the portion of Palmer relied upon by Petitioner's expert actually **disparages** the existing "industry standard network protocols," and explains instead how its method differs from—and improves upon—those protocols. Specifically, Palmer states:

> Accordingly, it would be desirable to provide a method for determining when a communication device should rate shift or roam in a wireless environment. The method

> would improve communication connections and performance by reducing the number of required 3retransmissions, offer an optimum bandwidth, and faster response time. **The method would further reduce network connection losses due to the use of industry standard network protocols** by the wireless media. Furthermore, the method would be flexible and anticipate the rate shift and roam requirements, even as the communication environment evolves.

Ex. 1004, 2:47–57 (emphasis added). In context, Palmer discusses how its method would reduce the "network connection losses" that occur when using "industry standard network protocols."

86. Petitioner's expert also implies that Palmer's access point 40 "performs measurements of various characteristics of the wireless network connection between an access point 40 and a portable terminal 20." Ex. 1002, ¶¶ 63–64. However, as I describe above in Paragraphs 69–71, Palmer describes only that the terminal 20, or the centrally located devices such as network 14 or central host processor 12 (in Fig. 1), or a device in administration building 33 (in Fig. 2), perform measurements for making rate or roam decisions.

87. Furthermore, as described in Section VI, the Court has construed "[routes/routing] information to the first mobile station and the second mobile station, respectively" to mean "[directs/directing] information through a specified

path to the first mobile station and the second mobile station, respectively." Under this construction, the last element of the '794 Patent's claim one is interpreted to mean, "wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, directs information through a specified path to the first mobile station and the second mobile station, respectively."

88. Notably, I understand that before the district court, Petitioner has taken the position that no WLAN transceiver can ***ever*** "route" information as the Challenged Claims recite, under the district court's construction of the term. Specifically, Petitioner's expert in that related litigation asserted that "[r]outing as a network concept, and as construed by the Court, does not occur in Wi-Fi." Ex. 2010, p. 10. I understand that Petitioner's expert went on to argue that "[i]n other words, 'routing'—under the Court's construction requiring more than merely forwarding packets—cannot occur at the WLAN transmitter." Ex. 2010, p. 10. In so arguing, Petitioner explained to the district court that "[t]he prior art IEEE 802.11 WLAN protocol in existence at the time of the application—what [the '794 inventor] called 'the de facto worldwide wireless LAN standard'—explicitly states that 'routing is not to be used' in the access point and the 'routing information parameter must be null' in the MAC layer transmission from an access point." Ex. 2011, p. 19 (citation

omitted).

5. Claims 2–4, 6

89. Claims 2–4 depend from claim 1. Because Palmer does not anticipate or render obvious claim 1, it does not anticipate or render obvious any of claims 2–4. Additionally, as described in section VII.B.2 above, Palmer does not teach or disclose a first and second transceiver that are coupled by a wireline connection (claim 2); instead they are connected by an entirely separate local area network. Palmer also does not teach or disclose a first and second transceiver that are removably coupled (claim 3) or disposed in a fixed site subscriber station (claim 4).

90. Claim 6 is a method claim version of apparatus claim 1. Palmer does not teach or disclose claim 6 for the same reasons above that it does not teach or disclose claim 1.

91. For the reasons given in Sections VII.A above and in this section VII.B, I disagree with Petitioner's expert, and do not believe that Petitioner and Petitioner's expert have presented prior art grounds that render the '794 Patent's claims 1–4 and 6 anticipated or rendered obvious by Palmer.

C. Hohnstein (Ex. 1005)

92. U.S. Patent No. 6,816,706 to Hohnstein et al. is entitled "Wireless

Communication Access Point." Ex. 1005.[5] Hohnstein's Abstract describes:

> A wireless access point includes at least one access antenna for communicating with wireless subscriber units. An access data terminal formats information packets for transmission by and after reception from each access antenna. At least one backhaul antenna interconnects the access point with the remainder of a wireless communication system. A backhaul data terminal formats information packets for transmission by and after reception from each backhaul antenna. Access data terminals and backhaul data terminals within the access point exchange information through baseband digital packets.

Ex. 1005 at Abstract. Hohnstein's system is depicted as follows:

[5] I generally agree with Section II.D.2 ("Hohnstein") from the POPR. Therefore, some of this overview section is reproduced from that section of the POPR, with further edits.

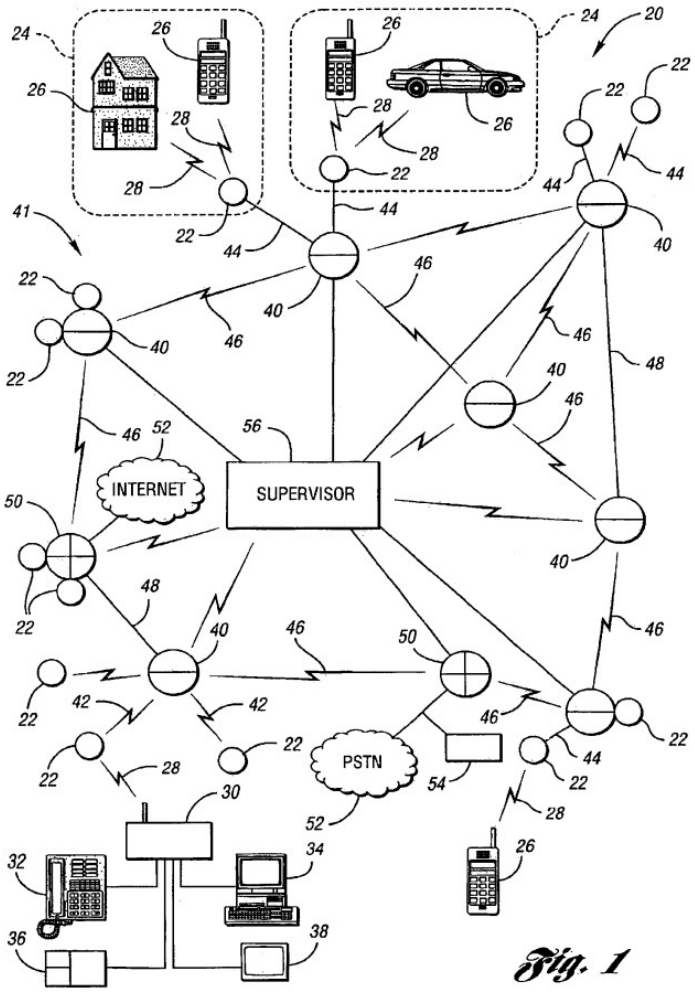


Fig. 1

Ex. 1005, Fig. 1. Each local radio access point 22 ("LRAP") "defines coverage area 24 such as, for example, a cell, covering a reception range of access point 22." *Id.*, 4:12–14.

93. Although Hohnstein's Abstract states "[a]t least one backhaul antenna interconnects the access point with the remainder of a wireless communication system," Hohnstein later states "[a]ccess point 22 may be in contact with one or more radio access distribution points 40 over radio link 42, may be wired or cabled to distribution point 40 through wireline link 44, or may be packaged with

distribution point 40." *Id*., 5:45–48. The latter statement contradicts the former, as the latter indicates that an access point 22 does not necessarily have a backhaul antenna, and instead can connect to the distribution point network 40 in different ways. *Id*. at Abstract, 5:45–48, Figs. 1 & 2. Hohnstein's Figs. 1 and 2 match the latter statement, by showing at least some access points 22 that only have a wired backhaul connection 44 rather than a wireless backhaul connection 42, and other access points 22 that touch a distribution point 40 (representing that the two are packaged as one unit). *Id*. As such, a POSITA understands that connections between access points 22 and distribution points 40 in Hohnstein can take on a variety of forms—including wired cable, wireless, or even within the same unit. *Id*.

94. Hohnstein also describes that connections between access points 22 and distribution points 40 are point-to-point, because each access point 22 has a dedicated front end interface in distribution point 40. Ex. 1005, 8:34–36 (stating "[d]istribution point 40 includes one or more front 35 end communication interfaces 100, each front end interface communicating with one access point 22"). These point-to-point connections are further depicted in Fig. 2, reproduced below, showing an expanded view of a distribution point 40 plus its connections to front-end access points 22 and several back-end devices, such as other distribution points 40, Communication System 52 and Supervisor 56.

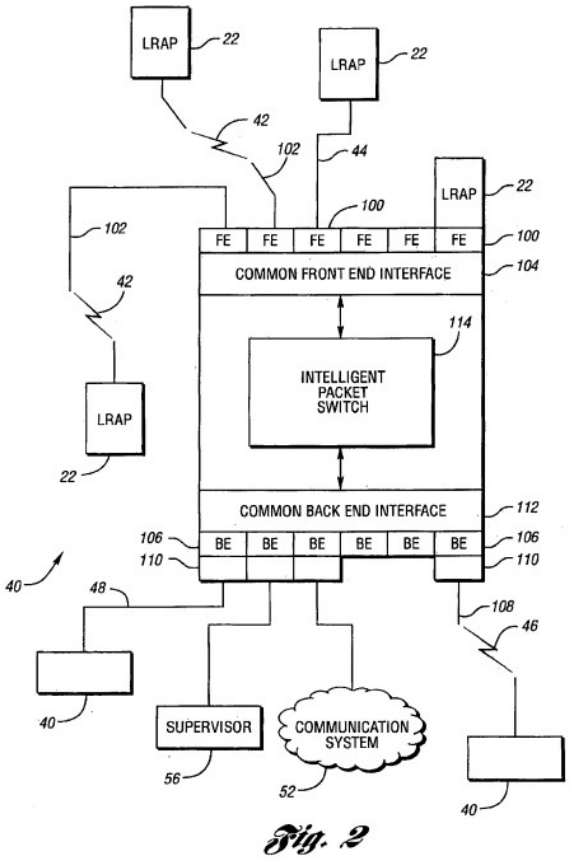


Fig. 2

Ex. 1005, Fig. 2. As shown in Fig. 2, each connection from a distribution point 40 to an access point 22 is point-to-point—rather than point-to-multipoint—because each connection to a distinct access point 22 has its own front end ("FE") interface 100. *Id*.

95. Hohnstein never refers to connections between a distribution point 40 and an access point 22 as a WAN or WWAN or wide area network, and in fact does not use those terms at all. Ex. 1005. Furthermore, even if one were to hypothesize that those connections are somehow a WAN, Hohnstein still describes that they would be individual, point-to-point links using different protocols. This contradicts

the teaching of the ’794 Patent’s claims, wherein a base station communicates with a plurality of wireless communication devices according to a single WWAN protocol such as a cellular base station would.

96. In addition to differences between Hohnstein and the ’794 Patent in terms of how access points are connected, there are also differences in how the distribution points (i.e. the alleged “base stations” by Petitioner) are interconnected. In Hohnstein, each distribution point 40 connects with one or more other distribution points 40 via point-to-point wired connections 48 or point-to-point radio links 46. Such a network can be referred to as a “mesh network.” *See* Ex. 2013, pp. 3 (IBM Dictionary, defining mesh network as “[a] network in which there are at least two nodes with two or more paths between them… See Figure 96”) and 4 (with Figure 96, reproduced below).

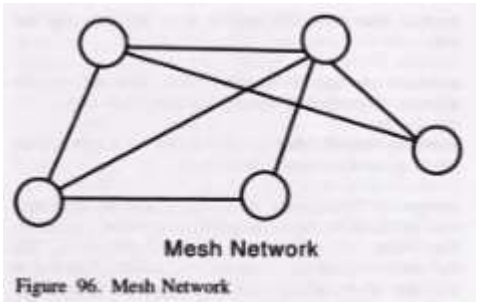


Figure 96. Mesh Network

Mesh networks are single-layer, modular networks that lack the architectural designs of cellular networks utilizing base transceiver stations, and wherein many if not most or all nodes interconnect with each other. *See, e.g.*, Ex. 1005, Figs. 3 & 6. In Hohnstein, each distribution point 40 connects directly with one or more

other distribution points 40, with each direct connection made via a wired connection 48 or a point-to-point radio link 46. While these interconnections may be influenced by geographical location, there are no predefined architectural rules for how to interconnect them, and numerous combinations are possible. Each component is an ATM/IP switch, with operation differing only based on what role each individual switch plays (at that time) within the overall mesh network:

> Distribution points 40 are always peers at the IP and ATM layer, while access points 22 are clients of distribution points 40. As such, ***each ATM/IP switch 300 functions as a server when operating as distribution point 40 and as a client when operating as access point 22.***

Ex. 1005, 11:15–20 (emphasis added).

97. Mesh networks such as Hohnstein's have a different architectural design than cellular networks utilizing base transceiver stations, such as in Figs. 2 and 3 of the '794 Patent. Ex. 1001, Figs. 2 & 3. In the '794 Patent, each remote modem has a single backhaul connection to a core network, rather than all the remote modems being connected in a mesh network. *Id*. This difference provides further evidence that Hohnstein's invention does not encompass expanding cellular WWAN using WLAN hot spots, and therefore is distinct from the '794.

98. Regarding its local networks, Hohnstein describes wireless links 28 between subscriber units 26 and access points 22 as follows:

> Wireless link **28** may be any form of electromagnetic signaling not confined to a wire or cable, including energy radiated by antenna as well as visible and invisible light. As will be appreciated by one of ordinary skill in the art, wireless link **28** may be implemented by any access technology, including CDMA, TDMA, FDMA, OFDM, analog, and the like. Modulation techniques that may be used with the present invention include FSK, BPSK, QPSK, m-ary QAM, FM, AM, and the like. Further, the invention does not depend on modulation frequency or on the use of FDD or TDD. In a preferred embodiment, the access technology, frequency, and modulation method for establishing wireless link **28** are based, in part, on local geography, local regulations, noise and distortion sources, other operating wireless systems, cost, or any other suitable parameter. Subscriber unit **26** and access point **22** may establish wireless link **28** using a plurality of combinations of access technology, frequency, and modulation techniques.

Ex. 1005, 4:29–46. As described in this excerpt, Hohnstein does not teach that the wireless links between an access point 22 and two or more subscriber units 26 use a single WLAN protocol. Instead, the links use "a plurality of combinations of access technology" and "any form of electromagnetic signaling." *Id*.

99. Hohnstein has two passages regarding to subscriber station signal quality, reproduced as follows:

In an embodiment of the present invention, a quality error bit rate is established for each subscriber unit 26. This quality error bit rate may be based on the location of subscriber unit 26 within communication system 20, the class of service assigned to subscriber unit 26, the grade of service assigned to subscriber unit 26, the data or transmission rate of service assigned to subscriber unit 26, or any other suitable parameter. The quality error bit rate may be modified while subscriber unit 26 is within communication system 20 to reflect changing conditions such as noise, demand, connectivity, or any other suitable parameter. Applications providing services to subscriber unit 26 may adjust these services based on the quality error bit rate. For example, an application providing streaming audio and video may reduce the frame update rate as noise increases, guaranteeing successful transmission at a lower information rate. The information rate may be further reduced to provide only still pictures and audio if conditions continue to worsen. The information rate may also be automatically changed if subscriber unit 26 moves between coverage areas 24 with differing transmission capabilities or loads.

Control of the information rate may be achieved by having subscriber unit 26 monitor a signaling channel transmitted by access point 22 for each coverage area 24. This signaling channel informs subscriber unit 26 when to

transmit information, how much information to transmit, the information transmission rate, and the like. The signaling channel may be controlled by a central supervisor, described below.

Ex. 1005, 5:1–29.

In an embodiment of the present invention, each subscriber unit 26 is autonomously registered with communication system 20 when subscriber unit 26 first enters coverage area 24 within communication system 20. Each subscriber unit 26 maintains registration as subscriber unit 26 moves from one coverage area 24 into another coverage area 24 within communication system 20 and is autonomously deregistered when subscriber unit 26 leaves communication system 20. To accomplish automatic registration and deregistration of subscriber units 26, each access point 22 periodically reports the status of subscriber units 26 within any controlled coverage area 24 to supervisor 56 performing registration and authentication. Each access 20 point 22 communicates with subscriber units 26 to determine status. When a subscriber unit 26 voluntarily enters or leaves coverage area 24, such as by powering up or down, subscriber unit 26 transmits a particular signal to access point 22. Information is also received from subscriber unit 26 in response to periodic queries from network 20. Access point 22 may determine the absence of subscriber unit 26

> from coverage area 24 if no communication is received after a particular time interval. Algorithms for registering and deregistering subscriber units 26 may be based on various factors including quality of service, traffic, location, service type, network topology, and the like.

Ex. 1005, 8:7–31.

100. In the first passage above, there is no teaching of an access point monitoring signal characteristics. The only thing an access point does is transmit a signaling channel that subscriber stations monitor. *Id*. at 5:22–24. Otherwise, the subscriber stations and the whole communication system 20 monitor a quality error bit rate of the whole system so that "[a]pplications providing services to subscriber unit 26 may adjust these services based on the quality error bit rate." *Id*. at 5:1–29.

101. The second passage above describes "[a]ccess point 22 may determine the absence of subscriber unit 26 from coverage area 24 if no communication is received after a particular time interval." *Id*. at 8:25–28. A POSITA might assume, based on this passage, that the access point would notify supervisor 56, since supervisor 56 performs registration and authentication. *Id*. at 8:15–19. However, there is no teaching here or in Hohnstein generally that an access point "monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, [directs

information through a specified path] to the first mobile station and the second mobile station, respectively," as required by the challenged claims and claim constructions.

D. Hohnstein in Combination with Palmer (Ground 2) Does not Teach or Disclose the Challenged Claims.

102. The Petitioner's starting premise for Ground 2 is that the PTAB already found "similar claims" unpatentable based on Hohnstein. Pet. at pp. 33–36, Ex. 1010 (IPR2017-01178 (Patent 9,225,555), Paper 21, Final Written Decision). In the petition, Petitioner provides a detailed table of the '555 Patent's claims in one column, the '794 Patent's claims in a second column, and excerpts from Ex. 1010 in a third column. *Id*. However, it is clear from this table, and from my table and explanation in Section V.D above, that the '794 adds substantial claim language versus the '555 Patent. This substantial claim language is outside the scope of the PTAB's findings in IPR2017-01178.

103. I note for reference that Petitioner combines Palmer with Hohnstein primarily with respect to claim element [1.d], "wherein the second transceiver monitors…" Pet. at pp. 40–60; Ex. 1002 at ¶¶ 125–132.

104. I address below why, in my opinion, neither Hohnstein alone nor Hohnstein in combination with Palmer teaches or discloses the additional claim language of the '794 Patent versus the '555 Patent.

1. [1.preamble] and [1.a] A wireless communication device, comprising: a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol; and

105. Petitioner and Petitioner's expert attempt to address this claim limitation, but fail to show how Hohnstein teaches the language in this claim that is distinct from the '555 Patent's claim: "wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices **according to a wide area wireless communication protocol**" (emphasis added). *See* § V.D above, Ex. 1002 at ¶¶ 116–121, 123, 133–141.

106. Petitioner's expert states "Hohnstein describes a first wireless transceiver (backhaul system 550, including backhaul antenna 552 and backhaul data terminal 554) operable to communicate with a base station (e.g., another distribution point 40) over a wireless link 42 (also referenced in Hohnstein as 'backhaul communication')." Ex. 1002 at ¶ 137. However, Hohnstein describes this as a point-to-point link, stating, "[t]ypically, backhaul antenna 552 is a directional antenna aimed at a corresponding antenna at another location." Ex. 1004, 15:18–20. This corroborates my discussion in Section VII.C, Paragraphs 95–97, that Hohnstein describes a mesh-connected, point-to-point backhaul. As discussed in Section VII.C, such a system does not teach or disclose the claim term "a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other

wireless communication devices according to a wide area wireless communication protocol." Instead, Hohnstein teaches an older, point-to-point backhaul arrangement that, to the extent Hohnstein's system can be considered a WWAN at all, does not use one, point-to-multipoint WWAN protocol as recited by the claim.

107. In support of Hohnstein's alleged teaching of a WWAN protocol, Petitioner's expert states,

> The communications between the distribution point 40 and the multiple access points 22 via wireless link 42 involve a wide area communication protocol, as Hohnstein describes such communications as "backhaul communication" that includes communication over the Internet, which involves wide area networks and communication protocols. *Id.*, 16:15–21, 8:49–55.

Ex. 1002, ¶ 141. This is a significant misrepresentation. The cited passages are repeated here:

> The frequencies and formats for transmission are based on regulatory requirements, frequency availability, data rates provided, noise, and other disturbances. Typical backhaul frequencies include 6, 11, 18 and 23 GHz licensed bands for DS3/OCS transmission and 5.8 and 24 GHz for unlicensed ATM-25 transmission.

Ex. 1005, 16:15–21.

> Distribution point 40 also includes back end communication interfaces 106 for connecting distribution point 40 with additional distribution points 40, with supervisor 56, and, if distribution point 40 is a gateway 50, with telecommunication systems, private network systems, video distribution systems, the Internet, or the like. This may be typically referred to as backhaul communication.

Ex. 1005, 8:49–55. The first passage emphasizes that the links are point-to-point microwave links at 5.8, 6, 11, 18 and 23 and 24 GHz, corroborating Hohnstein's other teachings that I discussed previously. The second passage discloses that distribution points 40 can ultimately connect with (or be) a gateway 50 and then connect to the Internet. Ex. 1005, 8:49–55 and Fig. 2 (showing a gateway 50 and the Internet 52 on the left side in the middle). However, this is much different that stating that wireless links 42 themselves are part of the Internet. They are not; rather, they are part of Hohnstein's private network. As such, even if communications over the Internet may involve wide area networks and communication protocols, this says nothing about Hohnstein's wireless links 42.

108. As discussed in Sections VII.C above, Hohnstein does not describe its system as a WAN or WWAN, and does not teach or disclose "wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication

protocol”

2. [1.b] a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol

109. As discussed in Paragraph 98 above, regarding its local networks, Hohnstein describes wireless links 28 between subscriber units 26 and access points 22 as follows:

> Wireless link **28** may be any form of electromagnetic signaling not confined to a wire or cable, including energy radiated by antenna as well as visible and invisible light. As will be appreciated by one of ordinary skill in the art, wireless link **28** may be implemented by any access technology, including CDMA, TDMA, FDMA, OFDM, analog, and the like. Modulation techniques that may be used with the present invention include FSK, BPSK, QPSK, m-ary QAM, FM, AM, and the like. Further, the invention does not depend on modulation frequency or on the use of FDD or TDD. In a preferred embodiment, the access technology, frequency, and modulation method for establishing wireless link **28** are based, in part, on local geography, local regulations, noise and distortion sources, other operating wireless systems, cost, or any other suitable parameter. Subscriber unit **26** and access point **22** may establish wireless link **28** using a plurality of

> combinations of access technology, frequency, and modulation techniques.

110. Ex. 1005, 4:29–46. As described in this excerpt, Hohnstein does not teach that the wireless links between an access point 22 and two or more subscriber units 26 communicate according to a local area wireless communication protocol which requires a single WLAN protocol to be used. Instead, Hohnstein's links use "a plurality of combinations of access technology" and "any form of electromagnetic signaling." *Id*. This is in contrast to the single local area wireless communication protocol described and claimed in the '794 invention. Ex. 1001, Figs. 2 & 3, 3:41–54. Therefore, Hohnstein does not teach claim element 1.b, as alleged by Petitioner and Petitioner's expert. Ex. 1002, ¶¶ 142–145.

3. [1.c] wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile station and provides the first downlink signal to the second wireless transceiver and wherein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol; and

111. As described in Sections VII.C and VII.D.1–2 above, Hohnstein does not teach or disclose a first wireless transceiver and a second wireless transceiver that satisfy the claim language, as Petitioner alleges. Petitioner does not allege that Palmer adds anything over Hohnstein to elements 1.a–c. Therefore, Hohnstein in

combination with Palmer does not teach or disclose the '794 Patent's claim element [1.c].

4. [1.d] wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively

112. Petitioner's expert opines that both Hohnstein and Palmer teach this element, although he evidently sees a gap in Hohnstein due to his inclusion of Palmer in the Ground 2 prior art combination. Ex. 1002, ¶¶ 150–154. However, for reasons I discuss in Paragraphs 99–101 above, Hohnstein does not teach this element.

113. As discussed with respect to Palmer, I understand that before the district court, Petitioner has taken the position that no WLAN transceiver can ***ever*** "route" information as the Challenged Claims recite, under the district court's construction of the term. *See* Section VII.B.4 above. For this reason, just as with Palmer, Petitioner cannot argue that Hohnstein, or a combination of Palmer and Hohnstein, "routes information" as the Challenged Claims recite.

114. Petitioner alleges that Hohnstein—and if not Hohnstein, then Palmer—discloses claim element [1.d]. Pet., 58–60. Specifically, for the "routes information" element, Petitioner alleges that "Hohnstein also describes the access points 22 routing information to first and second subscriber units 26." Pet., 59. Petitioner and

Petitioner's expert cite Hohnstein at 16:46-54, 2:50-54, 2:60-64, 3:4-6, 16:12-15 and 13:25-39. *Id.*; Ex. 1002, ¶ 151. However, none of these passages in Hohnstein teach or disclose "routing information to the first mobile station and the second mobile station" as the Challenged Claims recite. In fact, the first cited passage, 16:46-54, describes Fig. 13, which depicts "a combined access point 22 and distribution point 40" (see 16:37); the described "rout[ing]" is done by the distribution point 40 portion. Ex. 1005, 16:33–54. A POSITA would recognize that Hohnstein does not teach or disclose a "second transceiver" "routing information to the first mobile station and the second mobile station" as the Challenged Claims recite, particularly under the district court's construction of routing information. *See* Ex. 1005, *generally*.

115. The Petition's arguments that Hohnstein discloses the "monitoring" portion of claim element [1.d] also fail. Petitioner alleges that "Hohnstein describes the access system 564 in [sic] an access point 22 monitoring signal characteristics of downlink signals of subscriber units, since Hohnstein teaches that 'a quality error bit rate is established for each subscriber unit 26' which 'reflect[s] ***changing conditions*** such as ***noise***, demand, connectivity, or any other suitable parameter." Pet., p. 58 (citing Ex. 1005, 5:1–21) (emphasis in Petition).

116. To the contrary, Petitioner's citation to Hohnstein does not teach an access point monitoring signal characteristics. Instead, this disclosure teaches only

that an access point transmits a signaling channel that subscriber stations monitor. Ex. 1005, 5:22–24. Otherwise, according to Petitioner's cited passage of Hohnstein, the subscriber stations and the whole communication system 20 monitor a quality error bit rate of the whole system so that "[a]pplications providing services to subscriber unit 26 may adjust these services based on the quality error bit rate." Ex. 1005, 5:1–29.

117. Critically, there is no teaching in Petitioner's cited passages or in Hohnstein generally that an access point—what Petitioner identifies as the claimed "second transceiver" in Hohnstein—"monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, [directs information through a specified path] to the first mobile station and the second mobile station, respectively," as the Challenge Claims—as well as the district court's claim construction—require. Indeed, Petitioner does not even allege that this is the case, instead alleging that Hohnstein's subscriber unit 26—rather than its access point 22—performs the alleged "monitoring." Pet., 58–59.

118. For reasons I discuss in Section VII.B.4 above, Palmer does not teach this element. It is also my opinion that the combination of Palmer with Hohnstein does not teach or disclose more about this claim element than either of them

individually, so their combination also does not teach or disclose this claim element.

5. Claims 2–6

119. Claims 2–5 depend from claim 1. Because Hohnstein in combination with Palmer, and Hohnstein alone, do not anticipate or render obvious claim 1, they do not anticipate or render obvious any of claims 2–5. Claim 6 is a method claim version of apparatus claim 1. Neither Hohnstein in combination with Palmer, nor Hohnstein alone, anticipates or renders obvious claim 6, for the same reasons above that they do not teach or disclose claim 1.

120. For the reasons given in Sections VII.A–VII.C above and in this section VII.D, I disagree with Petitioner's expert, and do not believe that Petitioner and Petitioner's expert have presented prior art grounds that render the '794 Patent's claims 1–6 anticipated or rendered obvious by Hohnstein in combination with Palmer.

E. Mahany (Ex. 1006)

121. U.S. Patent No. 6,816,706 to Mahany et al. is entitled "Hierarchical Communication System Providing Intelligent Data, Program and Processing Migration." Ex. 1006.[6] Mahany's Abstract describes:

> A hierarchical communication system, arranged in a spanning tree configuration, is described in which wired

[6] I generally agree with the summary of Mahany in the POPR, including Section III.A.2.a. Therefore, some of this overview section is reproduced from the POPR, with further edits.

> and wireless communication networks exhibiting substantially different characteristics are employed in an overall scheme to link portable or mobile computing devices. Copies of data, program code and processing resources are migrated from their source toward requesting destinations based on request frequency, communication link costs and available local storage and/or processing resources. Each appropriately configured network device acts as an active participant in network migration. In addition, portable two-dimensional (2-D) code reading terminals are configured to wirelessly communicate compressed 2-D images toward stationary access servers that identify the code image through decoding and through comparison with a database of images that have previously been decoded and stored.

Ex. 1006 at Abstract. Mahany's "hierarchical communication system" is, in fact, primarily a hierarchy of LANs. Figure 1b, reproduced below, shows the hierarchy of a "First Local Area Network 37" and a "Second Local Area Network (Microlink Network) 40":

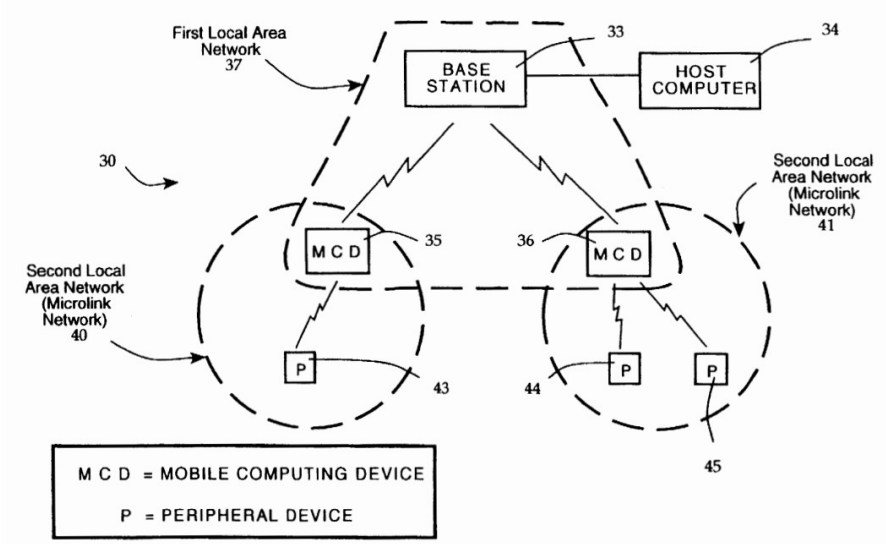


Figure 1b

Ex. 1006 at Figure 1b. The First LAN is a "Premises LAN" and the Second LAN is a "Peripheral LAN. 11:20–38. Mahany describes that "[o]ther types of spontaneous LANs, such as vehicular LANs, are also possible." *Id*. at 9:60–61.

122. Mahany introduces and discusses WANs as follows:

> For example. a portable computer device may be mounted in a delivery truck and a driver may desire to transmit data to or receive data from, a host computer or peripheral device at a remote warehouse location. While permitting such transmissions, wide area networks (WANs) only provide point-to-point communications, use a narrow bandwidth, and often exhibit heavy communication traffic. Moreover WANs require relatively higher transmission power—a negative factor in the ever increasing need for power savings associated with portable transceiving devices. As a result, WANs are generally

> slow and expensive. and simply do not provide an effective overall solution.

Id. at 3:9–20. Based on this discussion, and the few other mentions of WANs in Mahany, Mahany disparages wireless WANs and describes them as: 1) point-to-point communication links, 2) distinct from any hierarchical LAN networks of its invention, and 3) only to be used as a last resort when a WLAN connection is not available. *See id*. at 3:41–44, 45:40–48, 46:22–42, 48:55–65. For at least these reasons, Mahany does not disclose a WAN or a WWAN protocol as recited in the challenged claims.

F. Palmer in Combination with Mahany (Ground 3) Does not Teach or Disclose the Challenged Claims.

123. In Ground 3, Petitioner asserts Palmer in combination with Mahany to address a number of deficiencies in Palmer. Petitioner's expert opines:

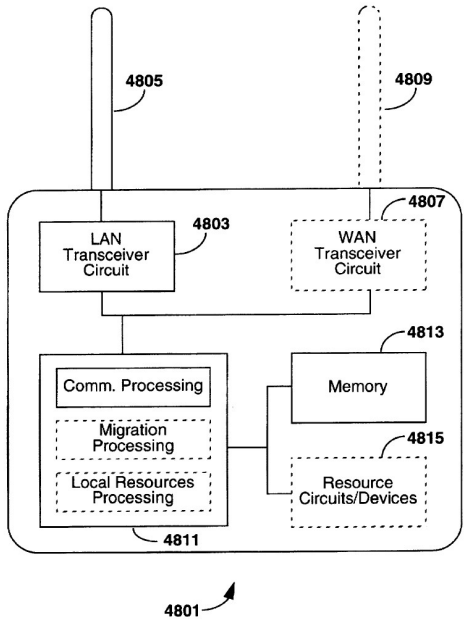
> For example, to the extent claims 1 and/or 6 are deemed to require the claimed device be integrated and that Palmer does not disclose such integration, Mahany discloses a device with integrated first and second wireless transceivers.

Ex. 1002, ¶¶ 185, 195–202.

> To the extent Palmer is not deemed to describe a "base station" (limitations [1.a], [6.a]), Mahany discloses a wireless base station topology for a WWAN.

Ex. 1002, ¶ 189.

> To the extent the first wireless transceiver's communications in Palmer is deemed not to involve a wide area wireless communication protocol (limitations [1.a], [6.a]) and/or the second wireless transceiver's communications is deemed not to involve a local area wireless communication protocol (limitations [1.b], [6.b]), Mahany discloses and/or suggests such distinctive protocols, as Mahany describes transceiver circuitry 4803 being a wireless "LAN" transceiver circuit while transceiver circuit 4807 being a wireless "WAN" transceiver circuit:



> Ex. 1006, Fig. 48 (annotated).

Ex. 1002, ¶ 191. I address each of these opinions here.

124. Petitioner's expert points to Mahany's access device 4801 as an integrated device with a LAN Transceiver Circuit 4805 and a WAN Transceiver Circuit 4807. Ex. 1002, ¶ 197; Ex. 1006, Fig. 48 (reproduced above). As a first point, note that the WAN Transceiver is optional (given its dotted box in Fig. 48) and, given the extent to which Mahany disparages WANs, to be used as a last resort. *See* Ex. 1006, 3:9–20, 3:40–43; *see also* ¶ 122, above.

125. As I describe in Section VII.E above, Mahany's invention is a network of hierarchical LANs, and an access device is the "Base Station" in Mahany's Figure 1b below.

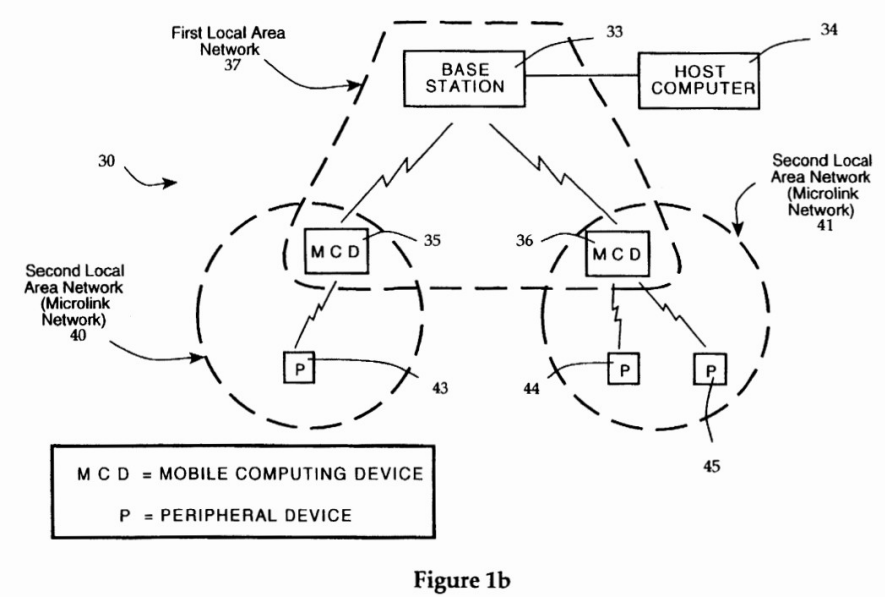


Figure 1b

Ex. 1006, Fig. 1b; *see also* 9:7–16 (stating "Herein, **base stations** which participate in routing and relaying data throughout the communication network are referred to as '**access points**.' If they also participate in the storage or migration of data and program code or in local processing, the base stations are referred to herein as

‘**access servers**.. As will become apparent below, an access point may be modified with additional circuitry and/or programming resources to become an access server. Additionally, **access servers** and **access points** are both referred to herein as ‘**access devices**.’”).

126. To whatever extent Mahany’s base station (which according to Petitioners would satisfy the “wireless communication device” recited in challenged claim 1, rather than the “base station” recited in challenged claim 1) has a WWAN transceiver, Mahany does not describe how it would communication with some other base station, wherein that base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol. Furthermore, as I state in Paragraphs 77–78 above, Palmer’s invention *requires* there to be a LAN, and for the remote antenna 34 to be a distinct device from each access point 40. Therefore, there is no reason a POSITA would use Mahany to integrate them.

127. Regarding Petitioner’s expert’s assertion reproduced above that, “[t]o the extent Palmer is not deemed to describe a ‘base station’ (limitations [1.a], [6.a]), Mahany discloses a wireless base station topology for a WWAN.” Ex. 1002, ¶ 189. I disagree. As I state in the previous paragraph, the base station in Mahany and its supposed WLAN transceiver would not be the claimed base station, and would not be any base station in Mahany.

128. Regarding Petitioner's expert's assertion that Mahany discloses and/or suggests such distinctive WLAN and WWAN protocols, because Mahany describes transceiver circuitry 4803 being a wireless "LAN" transceiver circuit while transceiver circuit 4807 being a wireless "WAN" transceiver circuit, I disagree. Ex. 1002, ¶ 191. The presence of a WLAN transceiver and a WWAN transceiver in one device does not suffice to teach the Challenged Claim elements "wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol" and "wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol," and Mahany does not teach or disclose these elements elsewhere.

129. Notably, Petitioner does not attempt to combine Mahany with Palmer for claim element [1.d], which as discussed above, is not disclosed in either Palmer or Hohnstein. Pet., 70–73.

130. For the reasons above, Mahany does not add any alleged teachings or features to Palmer, and the combination does not teach disclose any of the challenged claims.

G. Agrawal (Ex. 1007)

131. U.S. Patent No. 5,722,051 to Agrawal et al. is entitled "Adaptive Power

Control and Coding Scheme for Mobile Radio Systems." Ex. 1007.[7] Agrawal's Abstract describes:

> A dynamic combined power control and forward error correction control (FEC) technique for mobile radio systems which illustratively decreases the power consumed by wireless transmitters and increases the number of simultaneous connections which may be supported thereby. Individual transmitter-receiver pairs may adaptively determine the minimal power and FEC required to satisfy specified quality-of-service (QOS) constraints. Specifically, in accordance with an illustrative embodiment of the present invention, a first portion of a signal is encoded with a first code to generate a first encoded signal portion. Then, the first encoded signal portion is transmitted with a first power level. Next, parameter data is received, wherein the parameter data is representative of one or more characteristics of a received signal portion having been received by the receiver, the received signal portion having been based on the transmitted first encoded signal portion. A second code and a second power level is then determined based on the

[7] I generally agree with the summary of Agrawal in the POPR, including Section III.A.2.b. Therefore, some of this overview section is reproduced from the POPR, with further edits.

> received parameter data, and a second portion of the signal is encoded with the second code to generate a second encoded signal portion. Finally, the second encoded signal portion is transmitted with the second power level.

Ex. 1007 at Abstract.

132. Per its title and Abstract, Agrawal describes power and FEC control in a mobile radio system. *Id*. Other than describing its invention as applicable to cellular mobile radio systems, Agrawal does not disclose a WAN. Ex. 1007. Agrawal also does not disclose WLANs or their respective architectures. *Id*. Moreover, the second transceiver in the '794 Patent, which operates according to a WLAN protocol, has a specific role and function in the '794 Patent's claims: to monitor the signal characteristics of the LAN devices and route information accordingly. The fact that a "receiver" in Agrawal—which is not in fact part of a WLAN—monitors some signal characteristics does not provide any evidence that would render the challenged claims invalid . Therefore, even if a person of ordinary skill in the art were to combine this "receiver" with Palmer, it would not meet the claimed limitation.

H. Palmer in Combination with Agrawal (Ground 4) Does not Teach or Disclose the Challenged Claims.

133. In Ground 4, Petitioner asserts Palmer in combination with Agrawal. Apparently Petitioner sees the weakness in Palmer regarding claim element [1.d],

"wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station." Petitioner's expert opines that a POSITA would have been motivated to combine Palmer with Agrawal, and that Agrawal would teach the gaps in Palmer regarding element [1.d]. Ex. 1002, ¶¶ 203–214. I disagree.

134. As discussed in Section VII.G above, Agrawal discloses power and FEC control in a mobile radio system, i.e., a cellular system. A cellular system is not a wireless LAN, and Agrawal's techniques of power and FEC control in a cellular system have nothing to do with a WLAN or with monitoring signal characteristics of a downlink signal between a WLAN access point and a WLAN mobile device. As such, Agrawal adds nothing over Palmer, and a POSITA would not be motivated to combine them.

135. Notably, Petitioner does not attempt to combine Mahany with Palmer for the "routes information" element of claim element [1.d], which as discussed above, is not disclosed in either Palmer or Hohnstein. Pet., 78. Petitioner does not even allege that Agrawal monitors signal characteristics, and "based" on monitoring signal characteristics routes information accordingly. The specific claim limitation provides:

> wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, **and based on the first signal characteristics and the second characteristics, routes information** to the first mobile station and the second mobile station, respectively.

Ex. 1001, 10:38–44. Indeed, the purpose of the claimed second transceiver monitoring the signal characteristics is to "route information" and without such a disclosure, Agrawal falls short.

136. For the reasons above, Agrawal does not add any alleged teachings or features to Palmer, and the combination does not teach disclose any of the Challenged Claims.

I. Palmer in Combination with Agrawal and Mahany (Ground 5) Does not Teach or Disclose Claim 5.

137. In Ground 5, Petitioner asserts Palmer in combination with Agrawal and Mahany. However, for the reasons discussed for Grounds 3 and 4, this combination also fails to teach or disclose claim 5.

J. Hohnstein in Combination with Agrawal (Ground 6) Does not Teach or Disclose the Challenged Claims.

138. In Ground 6, Petitioner asserts Hohnstein in combination with Agrawal. Apparently Petitioner sees the weakness in Hohnstein regarding claim element [1.d], "wherein the second transceiver monitors first signal characteristics of the second

downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station." Apparently Petitioner sees the weakness in Palmer regarding this element as well, and proposes a Ground 6 using Agrawal instead of Palmer for the claim element [1.d] recited above. Petitioner's expert opines that a POSITA would have been motivated to combine Hohnstein with Agrawal, and that Agrawal would teach the gaps in Hohnstein regarding element [1.d]. Ex. 1002, ¶¶ 217–225. I disagree.

139. As in Ground 4, Petitioner does not attempt to combine Agrawal with Hohnstein for the "routes information" element of claim element [1.d], which as discussed above, is not disclosed in Hohnstein. Pet., p. 80. Once again, Petitioner does not even allege that Agrawal monitors signal characteristics, and "based" on monitoring signal characteristics routes information accordingly. *See* Pet., 80–82. As discussed above in Section VII.H, because Petitioner does not allege that Agrawal provides such a teaching, combining with Hohnstein would not meet the claim and Ground 6 fails.

140. As discussed in Section VII.G above, Agrawal discloses power and FEC control in a mobile radio system, i.e., a cellular system. A cellular system is not a wireless LAN, and Agrawal's techniques of power and FEC control in a cellular

system have nothing to do with a WLAN or with monitoring signal characteristics of a downlink signal between a WLAN access point and a WLAN mobile device. As such, Agrawal adds nothing over Hohnstein, and a POSITA would not be motivated to combine them.

VIII. OPINIONS

141. For all the reasons described above, it is my opinion that none of Petitioner's Grounds 1–6 anticipate or render obvious the Challenged Claims 1–6 of the '794 Patent.

I declare under penalty of perjury that the foregoing is true and correct. I acknowledge that willful false statements and the like are punishable by fine and/or imprisonment, that all statements made of my own knowledge are true, and that all statements made on information and belief are believed to be true.

Executed May 1, 2024, in Los Gatos, CA.

By: 

Douglas A. Chrissan, Ph. D.